

CHAPTER 3

AGRICULTURAL EXTENSION IN INDONESIA

Introduction

Indonesia's agricultural research and extension systems are large and complex. This chapter describes pertinent details of the extension subsystem. The next chapter discusses the research subsystem and research-extension linkages.

The chapter begins with a brief description of Indonesia and its agriculture before turning to the administrative units of the Ministry of Agriculture relevant to this study. For convenience of exposition, I describe first the ministry directorates-general, *Bimas*, AAET, and the provincial and district units, before discussing the extension system in more detail. I focus especially on the roles of the subject-matter specialists (SMSs, the respondents in this study) and of the Agricultural Information Centers. The chapter concludes with a brief discussion of the mass media related to agriculture.

Indonesia: The setting

Indonesia is a land of superlatives. The world's largest archipelago, its 13,667 emerald-green islands arc along the equator from mainland Southeast Asia to Australia, dividing the Indian Ocean from the Pacific. More than 5000 km from east to west, Indonesia stretches further than from Lisbon to the Urals, from Hammerfest to Aswan, or from Los Angeles to Halifax. It contains five of the world's largest islands: Kalimantan (the Indonesian part of Borneo), Sumatra, Irian Jaya (the Indonesian half of New Guinea), Sulawesi and Java. It is home to numerous active volcanoes, vast swamps, and Asia's largest tropical forests.

Indonesia's inhabitants are no less remarkable than its landscape. Its 188 million people make it the world's fourth most populous country (after China, India, and the United States). Over centuries, they have constructed intricate irrigation systems feeding beautiful rice terraces that climb mountain slopes toward the sky, developed a rich cultural heritage, and evolved unique forms of architecture, dance, textiles, and other art forms. They belong to numerous ethnic groups and speak more than 250 languages. While Indonesia has the world's largest population of Muslims (87% of Indonesians profess Islam), there are numerous adherents of Christianity (7%), Buddhism and Hinduism. This bewildering variety gives real meaning to *Bhinneka tunggal ika* "Unity in diversity," the national motto.

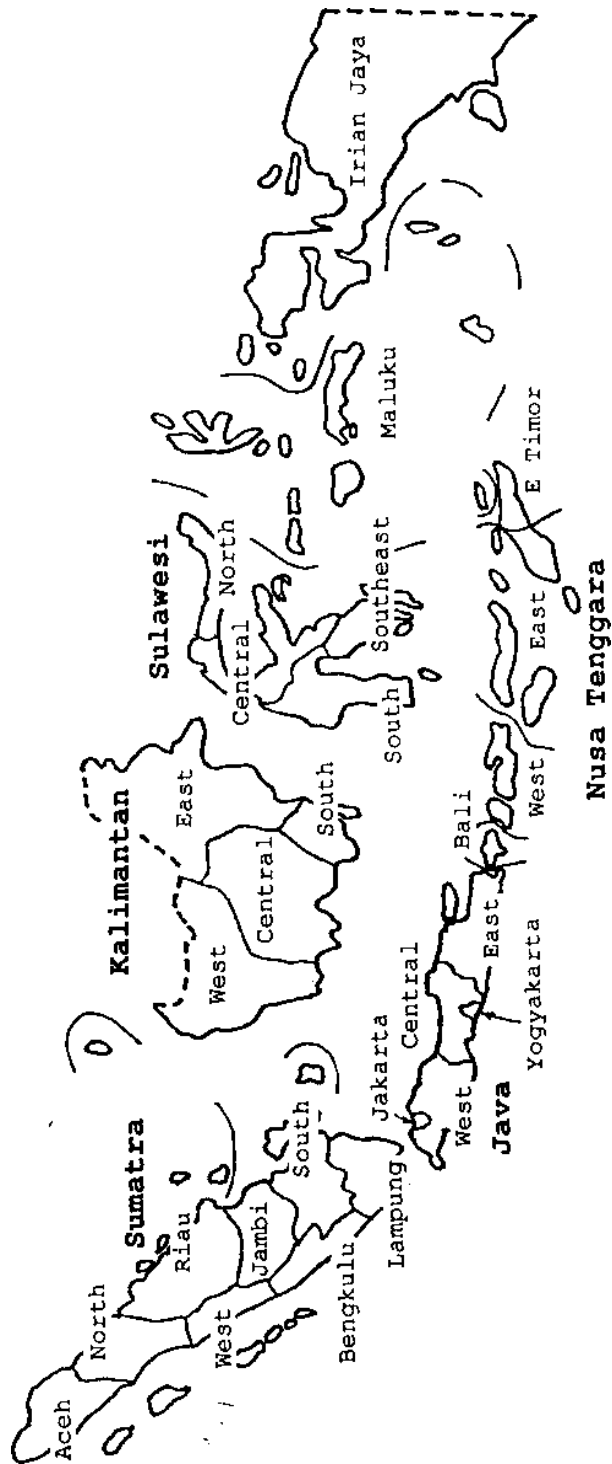


Figure 3.1 Provinces of Indonesia.

The island of Java, covering only 7% of Indonesia's land area, is home to 61% of its population (AARD 1988:3). With an average population density of 755 people/km² (in 1985), Java rivals the valleys of the Ganges, Yangtze and Nile as the most densely populated area of the world. The rest of Indonesia, by contrast, has only 31 people/km². Java has the most fertile soils and produces most of the country's food and manufactures.

Indonesia's size, diversity, and geographic fragmentation pose unique challenges to government. Yet the country has been remarkably stable politically since 1966. Rapid economic growth has followed, particularly in the industrial sector, bolstered by exports of petroleum, natural gas and timber. In the 1980s Indonesia enjoyed high annual GNP growth rates, causing observers to name it along with Malaysia and Thailand as a potential newly industrializing country.

Administratively, the country is divided into 27 provinces (Figure 3.1). At the second tier of local government are 242 districts (*kabupaten*) and 54 urban areas (*kotamadya*). Below this are subdistrict (*kecamatan*), village (*kelurahan*) and neighborhood (*rukun warga* and *rukun tetangga*) levels. Most government ministries are represented at the provincial and *kabupaten/kotamadya* level through specialized local government offices.

Agriculture in Indonesia

Despite growth in other sectors, agriculture continues to be of major importance in Indonesia's economy and society. In 1988 the agricultural sector contributed about 20% of the country's gross domestic product, and provided one-third of the nation's non-oil exports by value. Natural rubber, palm oil, coffee, tea, shrimp, and spices are major agricultural exports. Indonesia is also a major producer of rice and coconuts, though almost exclusively for local consumption.

Agriculture employs about 35 million people, or about half the total labor force. About 71 million Indonesians (two-thirds of the total population) are directly dependent on agriculture. Croplands cover about 22 million of Indonesia's land area of 190 million ha. Of these, perennial crops cover 6 million ha, and 7.6 million ha are irrigated (FAO 1991).

Rice is the major staple, accounting for more than half the area harvested to food crops. Much of the rice land is double- or even triple-cropped. Maize, cassava, soybeans, peanuts, and sweet potato are other major food crops. Tropical vegetables and fruits grown include chili, banana, mango, papaya and citrus. Temperate vegetables such as onions and cabbage are grown in the highlands. The major industrial crops are rubber, oilpalm, coffee, tea, sugarcane, pepper, coconut, cloves, and cacao. Livestock include chickens, ducks, sheep, goats, beef and dairy cattle, and water buffalo.

Table 3.1 Food crops and livestock production in Indonesia, 1966 and 1991^a.

	Units ^b	1966	1991 (est.)	% change 1966-91
Population	000 000	106 ^c	188	+77
Rice	000 t	13650	44321	+225
Maize	000 t	3717	6409	+72
Sweet potatoes	000 t	2308	1976	-14
Cassava	000 t	12100	16330	+35
Soybeans	000 t	353	1549	+339
Groundnuts	000 t	488	920	+89
Cattle	000 head	6700	10350	+54
Buffaloes	000 head	2790	3500	+25
Sheep	000 head	2340	5750	+146
Goats	000 head	11000	11300	+3
Chickens	000 000 head	64	590	+822
Ducks	000 000 head	22	30	+36

^a Source: FAO 1969, 1991.

^b Metric units used where applicable.

^c Estimate for 1965.

Between 1966 and 1991, Indonesia tripled its rice production, changing Indonesia from the world's largest rice importer to self-sufficiency in this staple (AARD 1988:11) (Table 3.1). Production increases in soybeans and chickens have also been spectacular. While some of the fluctuations in output in other *palawija* (non-rice annual) crops and livestock species can be attributed to data reporting problems, it appears that progress has been less consistent for these commodities, especially when compared to the population growth over the same period.

The Ministry of Agriculture

The Ministry of Agriculture is one of the larger units within the Indonesian government, receiving a budget of Rp 1,994,200 million (\$US 1,100 million) in 1989, second only to the Department of Transportation and Tourism (Syam and Mundy, in press).

Figure 3.2 Organizational structure of the Indonesian Ministry of Agriculture (simplified), showing locations of SMSs (based on Biro Humas Deptan 1991).

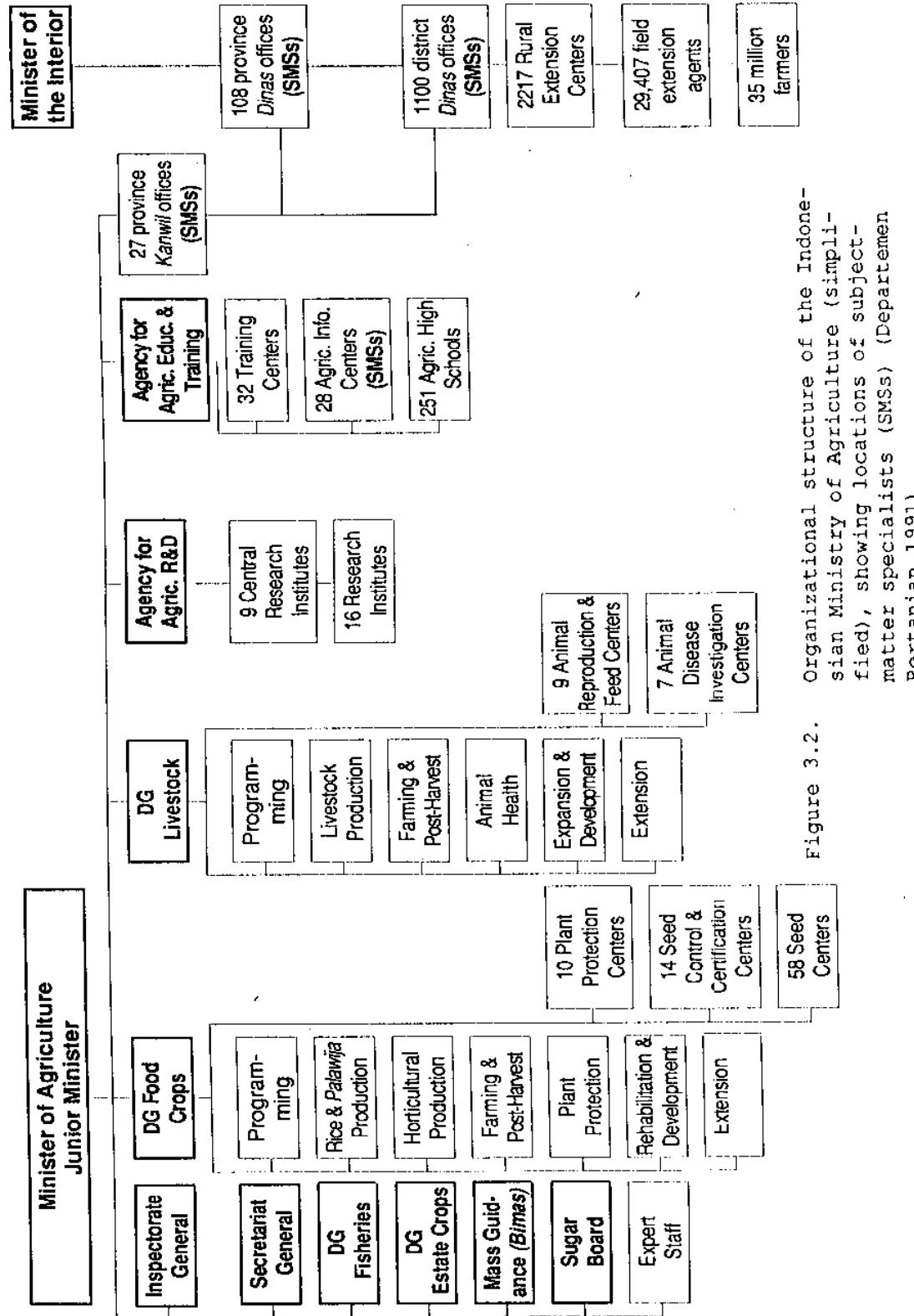


Figure 3.2. Organizational structure of the Indonesian Ministry of Agriculture (simplified), showing locations of subject-matter specialists (SMSs) (Departemen Pertanian 1991).

The organizational structure of the Ministry of Agriculture has undergone several revisions in response to changing circumstances. Further revisions were underway during 1991 while I was conducting the research for this study. As far as I could ascertain, the structure and organizational relationships described here were in effect at the time of the research.

In 1991 the Ministry was composed of ten first-echelon units (Figure 3.2), five of which concern this study: the Directorates-General for Food Crops and for Livestock Services, the Agency for Mass Guidance (*Bimas*), and the Agencies for Agricultural Research and Development (AARD, discussed in the next chapter) and for Agricultural Education and Training (AAET). In addition, we must examine agricultural offices at the provincial and district levels.

Directorate-General for Food Crops

The Directorate-General for Food Crops has eight second-echelon units, all located in the capital, Jakarta:

- The Secretariat coordinates the activities of the other seven units.
- The Directorate of Food Crops Programming (*Direktorat Bina Program Tanaman Pangan*) sets production targets, plans agricultural projects, monitors and evaluates activities, and collects statistics.
- The Directorate of Rice and *Palawija* Production (*Direktorat Bina Produksi Padi dan Palawija*) formulates recommendations, implements production programs, produces and certifies seed, and develops agricultural machinery for rice and *palawija* crops. *Palawija* crops include non-rice cereals, legumes, and root and tuber crops.
- The Directorate of Horticulture Production (*Direktorat Bina Produksi Hortikultura*) performs similar functions for the horticultural commodities.
- The Directorate of Food Crops Farming and Post-Harvest Processing (*Direktorat Bina Usaha Tani dan Pengolahan Hasil*) concentrates on the socio-economic and post-harvest aspects of farming.
- The Directorate of Plant Protection (*Direktorat Bina Perlindungan Tanaman*) monitors and attempts to predict attacks by pests and diseases in the field, tests pesticides, and assists in combatting pest outbreaks.
- The Directorate for Land Rehabilitation and Extensification (*Direktorat Bina Rehabilitasi dan Pengembangan Lahan*) aims to expand the cropped area and rehabilitate areas subject to soil erosion and other problems.
- Finally, the Directorate for Food Crops Extension (*Direktorat Bina Penyuluhan Tanaman Pangan*) coordinates extension activities relating to food crops.

The Directorate-General for Food Crops operates a number of regional units

around Indonesia. A partial list is given below. The numbers of units may not be accurate since they are taken not from official ministry sources but from the publication mailing lists of an AARD research institute (Puslitbangtan 1991).

- 14 Seed Control and Certification Centers (*Balai Pengawasan dan Sertifikasi Benih*).
- 33 Rice Seed Centers (*Balai Benih Induk Padi*), which multiply high-yielding rice variety seed.
- 25 Non-Rice Seed Centers (*Balai Benih Induk Palawija*).
- 10 Plant Protection Centers (*Balai Perlindungan Tanaman*).

Directorate-General for Livestock Services

The Directorate-General for Livestock Services has seven units with equivalent functions to those in Food Crops:

- The Secretariat.
- The Directorate of Livestock Programming (*Direktorat Bina Program Peternakan*).
- The Directorate of Livestock Production (*Direktorat Bina Produksi Peternakan*).
- The Directorate of Livestock Farming and Post-Harvest Processing (*Direktorat Bina Usaha Tani dan Pengolahan Hasil Peternakan*).
- The Directorate of Animal Health (*Direktorat Bina Kesehatan Hewan*).
- The Directorate for Livestock Expansion and Development (*Direktorat Bina Penyebaran dan Pengembangan Peternakan*).
- The Directorate for Livestock Extension (*Direktorat Bina Penyuluhan Tanaman Pangan*).

Like the food crops equivalent, the Directorate-General for Livestock operates a number of regional units. These include the following. Again, the numbers are drawn from AARD institute mailing lists (Balitnak 1991, Balitvet 1991).

- 7 Animal Disease Investigation Centers (*Balai Penyelidikan Penyakit Hewan*).
- 9 Animal Reproduction and Feed Centers (*Balai Pembibitan Ternak dan Hijauan Makanan*).

Agency for Mass Guidance

The Agency for Mass Guidance (*Badan Pengendali Bimbingan Massal, BP Bimas*) coordinates intensification programs in rice and other commodities (Taslim 1991). Such programs provide information through the extension system; credit through local branches of the Bank Rakyat Indonesia; and inputs, post-harvest processing and marketing through village-level cooperatives and kiosks. Various patterns of group collaboration have also been promoted, resulting in a veritable soup of acronyms: *Inmas, Insus, Supra Insus, Opsus, Innum*, amongst others. Hussein (1986) summarizes the history of extension in Indonesia.

Bimas has units reaching down to the village level:

- The provincial level *Bimas* unit is headed by the provincial governor. Day-to-day operations are handled by the head of the provincial office of the ministry (*Kanwil*).
- At the district level, the district head (*bupati*) and the head of one of the district agricultural service offices (usually that of food crops, *Dinas Pertanian Tanaman Pangan*) perform these roles.
- At the sub-district and village levels, the *Bimas* program is overseen by the sub-district head (*camat*) and village head respectively.

The existence of these local units and the participation in them of local government leaders at all levels contribute to the effectiveness of *Bimas* activities.

The *Bimas* program has undergone a number of major changes since its creation in 1965. Hussein (1986:116-143) briefly describes its evolution from a small action research project by Bogor Agricultural University to its current form. At the time of this study, there was debate as to its future direction and even its existence.

Agency for Agricultural Education and Training

Until recently, this was the Agency for Agricultural Education, Training *and Extension*. However, the extension function, never fully unified under one body as has been the case for most research since 1974, was returned to the four directorates-general for food crops, livestock, estate crops, and fisheries.

AAET coordinates and manages Indonesia's agricultural information and training institutions. These include (Biro Humas Deptan 1991:93-95):

- 251 agricultural high schools: 30 of these belong to the ministry, 88 to local governments, and 133 to private institutions.
- 32 Agricultural Staff Training Centers (*Balai Latihan Pegawai Pertanian*, some of which specialize on specific commodities, such as fisheries.
- 28 provincial Agricultural Information Centers (AICs, *Balai Informasi Pertanian*,

BIP). The AICs are key to the flow of information on new agricultural technologies; they are described in more detail below.

As mentioned above, responsibility for extension has never been brought into a single organization -- despite several changes in the allocation of extension duties within the Ministry. AAET is currently responsible for the education and training of extension personnel and for developing extension methods. Technical guidance of the personnel is the responsibility of the relevant directorates-general (SK Bersama 1991).

This distinction is often unclear to those outside the agencies concerned, and can cause some confusion to extension personnel also -- since they are (or have been) responsible to several superiors in different branches of the Ministry. For instance, an extension specialist in food crops may be answerable to the Directorate-General for Food Crops for technical guidance, depend on *Bimas* for salary and operating funds, rely on research information generated by AARD, use extension materials produced by AAET's Agricultural Information Centers, and be answerable to the local district or provincial government head -- as well as serve the needs of local farmers.

Provincial and district units

The Ministry of Agriculture operates or coordinates an array of provincial and district technical units to oversee and implement different aspects of its work. These are:

- At the provincial level, 27 provincial coordination offices (*Kantor Wilayah, Kanwil*), responsible directly to the Minister of Agriculture.
- 108 provincial-level Agricultural Service (*Dinas*) offices: one for each of the four major commodity groupings (food crops, estate crops, livestock, and fisheries) in each of Indonesia's 27 provinces. These offices are responsible administratively to the provincial governor but are technically accountable to the relevant directorate-general at the national level. *Dinas* offices are divided into divisions corresponding to directorates at the national level. The Division of Agricultural Extension directs, monitors, and evaluates provincial extension programs (Hussein 1986:156). Also housed in each provincial *Dinas* office are several extension subject-matter specialists (SMS, *Penyuluh Pertanian Spesialis, PPS*) -- the respondents used in this study.
- At the district (*kabupaten*) level, approximately 1100 district-level Agricultural Service (*Dinas*) offices, one for each of the four commodity groups in each of Indonesia's 296 districts and municipalities. Some districts, such as urban areas (*kotamadya*) do not have a full complement of *Dinas* offices. Like their provincial counterparts, the district *Dinas* offices are administratively responsible to the district head (*bupati*) or city mayor (*walikota*); they are technically accountable to their corresponding provincial *Dinas* office. Also like their provincial counterparts, they are divided into units corresponding to the directorates at the national level. Each district *Dinas* office also houses a number of SMSs, many of whom were also respondents in this study.

- District offices representing the Mass Guidance (*Bimas*) program. These offices are frequently combined with the district's Food Crops Agricultural Service office (*Dinas Pertanian Tanaman Pangan, Diperta*). I was not able to determine their number.
- Below the district level, 2217 local Rural Extension Centers (*Balai Penyuluhan Pertanian, BPP*). These house Indonesia's 29,400 field extension agents (Biro Humas Deptan 1991:94, 98).

Extension

The extension subsystem

Linking policy makers and research institutes with field extension workers and farmers is a complicated network of institutions (Figure 3.3). The extension organization is extremely large. According to *Bimas*, in 1990 there were some 29,407 field extension workers and 1485 subject matter specialists (Biro Humas Deptan 1991:98). An organization of this size poses major challenges, especially in the absence of a sophisticated communication infrastructure.

Coordination at the national level is performed by the National Agricultural Extension Commission (*Komisi Penyuluhan Pertanian Nasional, KPPN*), composed of the heads of the first-echelon agencies in the Ministry of Agriculture and chaired by the ministry's Secretary-General (Abbas, Tjitropranoto, and Yakub 1989, Abbas 1991, SK Mentan 1991). At the provincial and district levels, equivalent bodies are Agricultural Extension Coordination Forums (*Forum Koordinasi Penyuluhan Pertanian, FKPP-I* [at the provincial level] and *FKPP-II* [at the district level]). These are composed of local agricultural officials and extension specialists; scientists from local research institutes are also invited to attend (Suhardjo 1989:128).

Figure 3.3 Organization of agricultural extension in Indonesia (SK Bersama 1991).

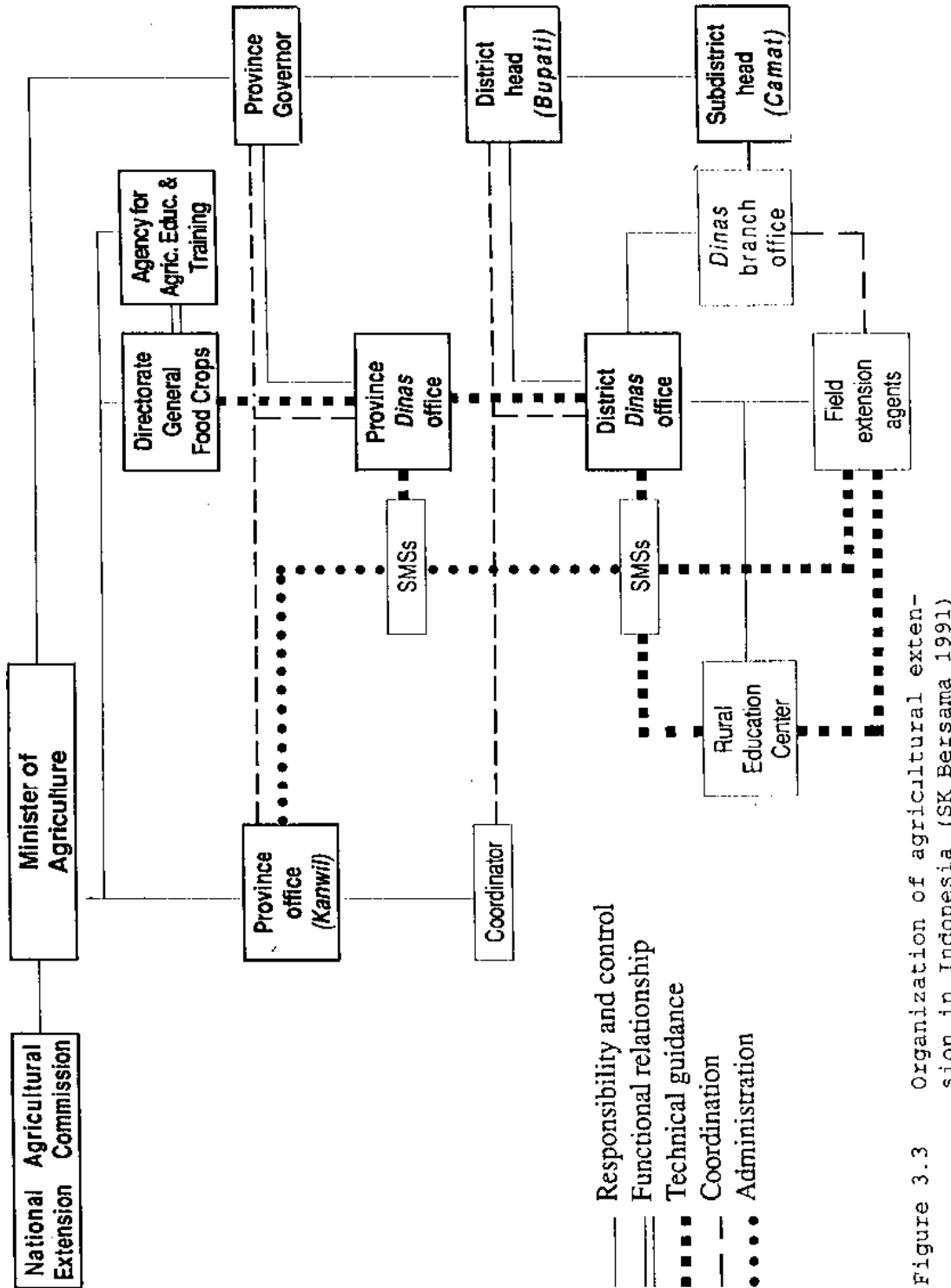


Figure 3.3 Organization of agricultural extension in Indonesia (SK Bersama 1991)

With World Bank sponsorship, Indonesia introduced the "training and visit" system for extension in the late 1970s (Sukaryo 1983, Jahi 1991, Benor and Harrison 1977, Benor and Baxter 1984). Under this system, graduate extension subject-matter specialists (SMSs, *penyuluh pertanian spesialis, PPS*) train field extensionists in seasonally relevant material at regular fortnightly training sessions. Each field extension worker (FEW, *penyuluh pertanian lapangan, PPL*) is assigned to a number of villages, and visits each village once every two weeks. The field extensionist works with groups of contact farmers (*kontak tani*) in each village, discussing relevant topics for the time of year. These contact farmers in turn are expected to disseminate their knowledge to "follower farmers" in their village. According to the Ministry of Agriculture (Biro Humas Deptan 1991:96-97) there are some 250,000 farmer groups, with some 14 million members, throughout the country. However, ministry officials admit privately that this is an overestimate of the number of groups actually functioning.

A number of village institutions are key to the success of this extension effort. These include the village cooperative (*Kooperasi Unit Desa, KUD*), which markets output to the national Food Logistics Board (*Bulog*); kiosks selling agricultural inputs; and the Village Unit Bank, a branch of the national *Bank Rakyat Indonesia*, which provides credit (Suhardjo 1989:134). All are coordinated through the *Bimas* program.

This scheme is hoped to allow a relatively rapid transfer of technology from research institutes to the farmers. It is also expected to allow for feedback, since field extensionists can refer field problems back to the relevant subject-matter specialist, who can if necessary refer them back to researchers.

The potential effectiveness of the extension set-up can be seen in the large increases in Indonesia's rice production experienced since 1966, and in the rapid adoption by farmers of modern wetland rice varieties. However, similar yield increases and adoption rates have not been evident with most other crops and commodities (Table 3.1). This may be related to other factors, though the emphasis given to rice in the extension system's efforts undoubtedly does play a role (see discussion in the next chapter).

Table 3.2 References on agricultural extension in Indonesia.

Extension	Ag Info Centers (AICs)
* Abbas 1991	* Rusyana 1984
* Abbas et al. 1989	* Samsisaputra 1987
* Azis 1990	* SK Mentan 1984
* Dir. Penyuluhan RRL 1990	• * Suharno 1986
• Harun 1987	Training and Visit extension, farmers' groups
* Hubeis 1987	* Abdul Adjid 1990
• Hussein 1986	• * Bahraini 1984
Ludgate et al. 1990	• Batoa 1985
• * Riyanto 1988	• * Damayani 1988
Röling et al. 1991	• * Holian 1990
* SK Mentan 1991	• * Nur 1986
* SK Bersama 1991	• * Subarma 1985
* Slamet 1990	• Suhardjo 1989
Sukaryo 1983	Sukaryo 1983
• Suradisastra and Soedjana 1990	• * Surialaga 1984
Syam and Mundy, in press	• * Suryono 1985
* Taslim 1991	• * Sutjipta 1982
* Wardojo 1990	• * Witjaksono 1990
• Warsito 1989	
• Wiratmadja 1987	
• Widjono 1986	

• Data-based study

* In Indonesian.

Overview of the literature on extension

Much has been written on the Indonesian extension system in recent years: Table 3.2 gives a partial list of references. While much of the literature lacks empirical support, a body of data-based research does exist on the functioning of the "lower" levels of the extension system, particularly of the field agent-farmer interface. Most of this research seems to have been performed by *sarjana* and master's students in the development communication program at Bogor Agricultural University, mostly in West Java (apparently for logistical reasons). Examples of these are Holian (1990), Nur (1986), Riyanto (1988), Subarna (1985), Surialaga (1984), and Suryono (1985) in West Java; Bahraini (1984) in West Sumatra; Sutjipta (1982) in Bali; and Witjaksono (1990) in Yogyakarta. I was not able to visit other university libraries to seek references, and searches of the Indonesian Agricultural Index revealed no other studies.

Most of the studies in English have been done by Indonesians studying overseas. They include Warsito's (1989) study of field agents' job performance in Yogyakarta; Wiratmadja's (1987) thesis on agents in West Java; Harun's (1987) study of extension publications in West Java; Widjono's (1986) research on upward communication within district *Dinas* offices; and Suhardjo's (1989) analysis of the T&V system in West Java. The most extensive and valuable study by a non-Indonesian is that by Hussein (1986). All these studies are dissertations or theses. I did not have access to any internal evaluations performed by the various extension agencies. To my knowledge, among these authors, only Widjono (1986) was an employee of AARD.

Other AARD authors writing about extension have largely confined themselves to two topics: research-extension linkages, and the adoption of research findings by farmers (see the later discussion of research-extension linkages).

Descriptions of the theoretical functioning of the upper echelons of the extension system abound (e.g., Taslim 1991; Abbas, Tjitropranoto and Yakub 1989), as do papers outlining extension policy and philosophy (e.g., Abbas 1991, Abdul Adjid 1990, Azis 1990, Dir. Penyuluhan RRL, Hubeis 1987, Slamet 1990, Wardojo 1990). However, I was unable to find any research on the functioning of extension agencies above the district level or of research-extension linkages above the level of individual researchers and extension personnel.

Agricultural extension specialists

Agricultural subject-matter specialists (*penyuluh pertanian spesialis, PPS*), the respondents in this study, are a key component of the extension system. They hold at least a *sarjana* (four years plus thesis) degree in an agricultural or social science. They are employed at various organizations:

- Provincial *Dinas* and *Bimas* offices (and some at *Kanwils*).
- District *Dinas* and *Bimas* offices.
- Agricultural Information Centers.

Their tasks are extremely diverse. They include (Sophia 1988:3-5):

- Preparing local extension plans for discussion at Agricultural Extension Coordination Forum meetings.
- Collecting information on new technologies from research institutes and universities, and providing feedback on field problems to these institutions.
- Maintaining links with other agricultural institutions at the national and local levels.
- Communicating with other SMSs about new technologies and government programs.
- Conducting surveys, analysis, and evaluations of extension activities.
- Advising agricultural officials in their areas of specialization.
- Writing, teaching, and participating in seminars.
- Collecting and translating materials to help solve field problems.
- Conducting field trials of research findings.
- Processing and analyzing survey and experimental data to develop extension plans and technology recommendations.
- Guiding field agents to use new technologies.
- Guiding and assisting field agents to prepare extension plans, improve their skills, and solve field problems.

These tasks can be summarized as (1) obtaining information on new technologies and translating it into a form usable by field agents and farmers, (2) testing technologies for local applicability, (3) training field agents, (4) solving field problems, and (5) liaising with other actors in the extension and administration systems.

SMSs face numerous constraints in obtaining information. Located at provincial and district capitals, they must travel to the nearest research institute or library obtain information that is not located in their offices. The budget to support such search is woefully inadequate: according to one interviewee in North Sumatra, an SMS receives an allowance (*materi operasional penyuluhan*) of only Rp 14,000 (\$US 7) per month to pay for *all* work expenses (field visits, field trials, and training materials, as well as information search). Field extensionists get even less: Rp 11,500 (\$US 6) per month. Unlike the AICs, provincial and district *Dinas* offices do not have libraries, and they are not routinely sent AARD publications (see next chapter). These constraints make it difficult for even highly motivated SMSs to obtain information. Most are therefore perforce likely to be dependent on information that arrives without any effort on their part. In Atkin's (1973:238) terms, they will thus engage in information *receptivity* rather than information *search* (see the section on Situation in Chapter 5).

Agricultural Information Centers

There are 28 AICs: one in each of the 27 provinces, plus a center with nationwide responsibilities at Ciawi, near Bogor in West Java. They are coordinated by AAET. Twelve have been operational since 1978; the remaining 16 have been in existence since 1985.

AIC roles The AICs have multiple roles (Harun 1987:5-7, Rusyana 1984, Samsisaputra 1987, Suharno 1986). The following list is based on the official ministerial decision establishing the centers (SK Mentan 1984):

- Collect, select and process data and information from various sources, such as research institutes, universities, libraries, government institutions, farmers, and rural people.
- Prepare information in a suitable form, such as publications, teaching aids, and audio-visuals.
- Disseminate information to extension institutions.
- Monitor and evaluate the efficiency and effectiveness of the information disseminated.

Several tasks have since been added (Harun 1987:5-7), including participation in provincial Agricultural Extension Forums, preparing extension messages for the mass media, and acting as a provincial center for statistical information on agriculture. But the main task of the AICs remains providing extension personnel with information and teaching materials.

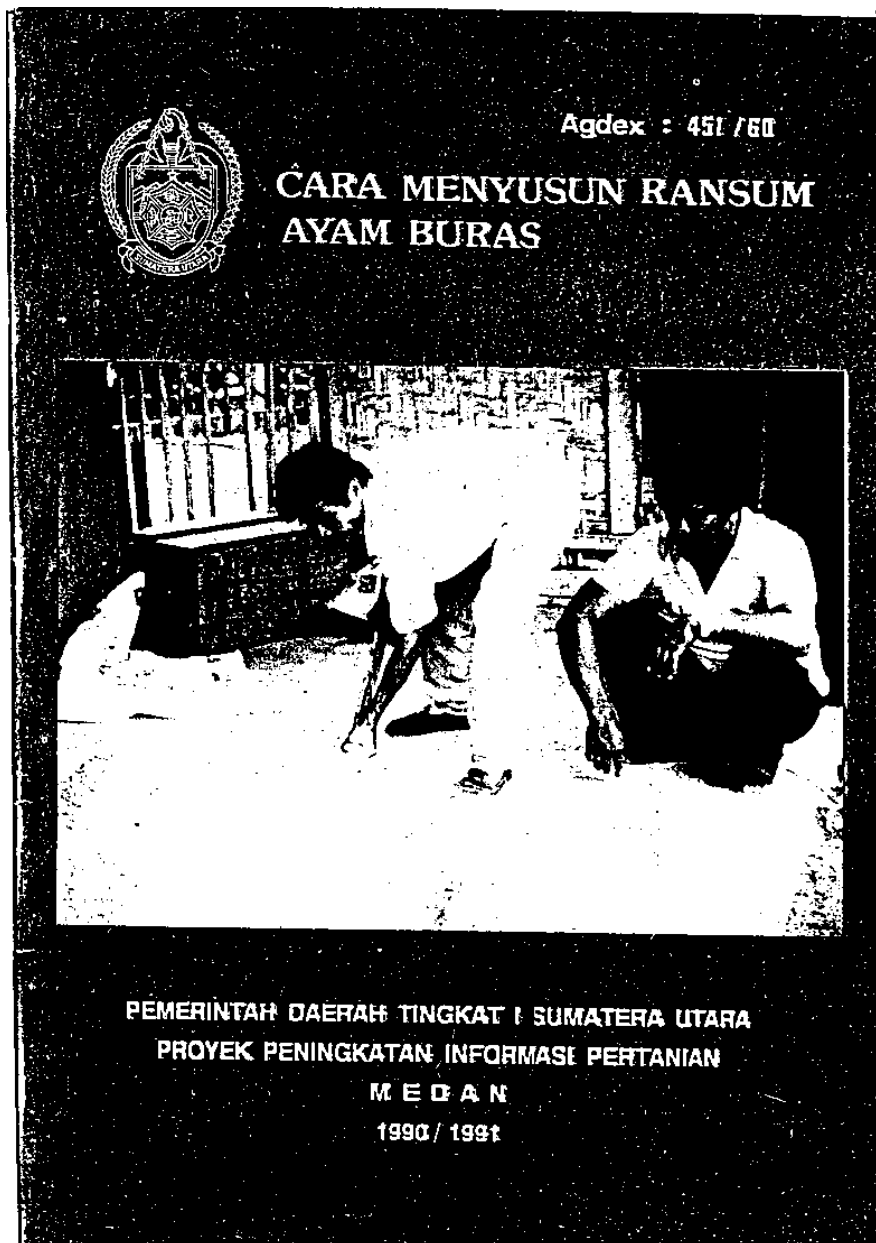
AIC staff and facilities The AICs are staffed by subject-matter specialists, typically about six per center. Unlike the SMSs in province and district offices, those at AICs are typically responsible for a discipline area rather than a particular set of commodities. Some have a background in extension or communication rather than, or as well as, an agricultural topic. The Ciawi AIC is responsible for training staff of other AICs in communication methods.

The AICs vary in the types of equipment they have available. At the four I visited (Ciawi, Lembang, Medan and Palembang), equipment included: a sheet-fed, single color, mini-offset printing press; a large-format camera for making halftones; a darkroom for processing black-and-white prints and slides; an audio studio; simple video recording and editing equipment; and a single computer (used mainly for word processing). Not all the AICs I visited possessed all these items.

Each AIC also has a library, frequented mainly by students from local universities. Three of the libraries I visited had a good range of AARD publications on the shelves; the other had very few, possibly because the AIC had been established relatively recently.

Media produced The AICs produce eight main types of media (described below). The number of copies produced seems to vary considerably among AICs and over time, apparently because of variations in funding. While I have no data on this, funding appears to have declined since the AICs were first established.

- Booklets (*brosur*, Figure 3.4), each about 30 pages long, printed in black and white with a 4-color cover and sometimes a 4-color insert. These cover topics ranging from the formulation of chicken feed to methods of forming farmers' groups. They are aimed at extension personnel. In 1984, the West Java AIC in Lembang printed between 10,000 and 20,000 copies of each issue (Rusyana 1984). According to an anonymous informant, the nationwide Ciawi AIC prints about 4000-4500 copies of its booklets, and aims them primarily at SMSs rather than field agents. The Palembang AIC produced four brochures in 1989/90. The Medan AIC prints 3000 copies each of the five booklets it produces in a year.



Front cover of a booklet on how to formulate rations for local chicken breeds, reproduced full size. The original contains 36 pages of text and two color photographs. The cover is in full color.

Figure 3.1 Booklet (*brosur*) produced by Medan Agricultural Information Center, North Sumatra.

- *Liptans*, single-page technical fact sheets aimed at farmers (Figure 3.5). *Liptan* is an abbreviation for *lembaran informasi pertanian*, or "agricultural information fact sheet." They are printed in a single color, and a second color is used to code the issue by topic using a modification of the Agdex filing scheme: red for livestock, pink for fruits and vegetables, and so on (BPLPP/Pustaka 1983). Each *Liptan* covers a single topic, such as the control of vascular streak dieback on cacao, and growing mushrooms on sugarcane leaf substrate. Rusyana (1984) has no information on the number printed at the Lembang AIC. According to respondents, the Ciawi center prints about 2500 copies of each issue; the North Sumatra AIC prints 3000 copies of each of the approximately 20 *Liptan* titles it publishes in a year; AIC Palembang produced 20 *Liptans* in 1989/90, printing 2500 copies of each.
- Posters, printed in full color on large sheets. In 1984, the Lembang AIC printed 8000 copies of each poster. None of the AIC personnel I interviewed mentioned producing any posters recently.
- Folders, single sheets folded twice to form a brochure, aimed at contact farmers. In 1984, AIC Lembang printed 10,000-30,000 copies of each. In 1989/90, the Medan AIC printed 6000 copies of a single title.
- Audiocassettes of recordings of songs and studio dramas, for extension agents' use and broadcast over local radio stations. The AICs at Ciawi and Palembang each produce about 10 titles a year. The number of copies is unknown; I estimate it to be about 250 (based on Suharno 1986:54 and BIP Ciawi 1990).
- Slide sets and accompanying booklets with instructions for the presenter. These are distributed to *Dinas* offices. Because of funding limitations, AIC Ciawi now produces a master copy only of each slide set; other AICs and institutions can order copies at a cost of Rp 60,000 (about \$US 30) each. AIC Medan produced three titles in 1991; because of funding limitations, only 10 copies of each were made, compared to the 60 copies normally produced. Respondents commented that slide sets were relatively expensive to produce: about Rp 1.5 - 1.8 million (\$US 750) per title.
- Videocassettes and 35 mm films. While at least some of the AICs have video recording and editing equipment, these are not of broadcast quality. Most district *Dinas* offices and Rural Extension Centers have no video playback units. AICs personnel also lack skills in video production. AIC Ciawi has made several videos and offers them to other AICs for Rp 15,000 (\$US 7) per copy. The cost of producing videos is high: about Rp 12,000,000 (\$US 6,000) per program. AIC Ciawi has cooperated with the national television corporation, TVRI, in producing television programs. The center produces about 10 35 mm movies a year and has made about 75 in all for distribution to other AICs. The Medan AIC produces videos occasionally on request.



Budidaya Rumput Raja

Juni 1992.

Agdex : 324

Hijauan pakan ternak merupakan makanan pokok bagi ternak ruminansia seperti, sapi, kerbau, kambing dan domba baik untuk kebutuhan hidup, pertumbuhan maupun untuk teproduksi. Oleh sebab itu penyediaan hijauan pakan ternak harus selalu tersedia setiap saat.

Untuk mendapatkan hijauan yang tersedia setiap saat dengan nilai gizi yang tinggi, tidak berbahaya dan disukai oleh ternak perlu dikembanexan hijauan (rumpun) unggul. Salah satu jenis rumput unggul yang sedang dikembangkan di daerah Sumatera Selatan dalam pemenuhan hijauan makanan ternak adalah rumput raja (King Grass).

Rumput raja yang merupakan hasil persilangan antara *Penisetum purpureum* (rumput gajah) dengan *Penisetum typoides*, adalah rumput bermutu tinggi, produksinya lebih tinggi dibandingkan dengan rumput lain, cepat dipanen, tahan kekeringan dan mempunyai rasa manis sehingga disukai oleh ternak.

Ciri - Ciri Rumput Raja

- Merupakan rumput betumur panjang (masa produktif 6 tahun).
- Bentuknya mirip tebu atau rumput gajah.
- Tumbuh tegak dan membentuk rumpun, setiap rumpun mempunyai 20 - 40 batang tanaman.
- Tinggi tanaman 3 - 4,5 meter, apabila dibiarkan dapat mencapai 7 meter.
- Berbatang tebal dengan daun agak kelubut dan kaku. Warna daun hijau tua, panjang daun dapat mencapai \geq 100 cm dengan lebar daun 2 - 4 cm.
- Bunga tersusun dalam tandan dengan warna keemasan.

PENANAMAN RUMPUT RAJA

- * Pengolahan Tanah
 - Sebelum penanaman tanah dibajak/dicangkul 1 - 2 kali kemudian diratakan,
 - Setelah tanah diolah, tanah dibersihkan dari sisa-sisa tanaman dan gulma,

- Pada tanah miring tanah tidak perlu diolah, cukup dibuat lobang - lobang menurut kontur tanahnya sedemikian rupa sehingga sekaligus dapat berfungsi ganda sebagai penahan erosi.

- Pada tanah yang datar ataupun tanah bericigasi dapat diolah setiap waktu, sehingga penanaman dapat dilakukan setiap saat dan perlu dibuat saluran antara bedengan,

- Pada tanah yang kering pengolahan tanah sebaiknya dilakukan pada akhir musim kemarau.

* Bibit Tanaman

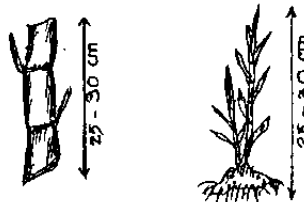
Rumput raja dapat ditanam dengan stek maupun dengan sobekan rumpun. Kebutuhan bibit per hektar dengan jarak tanam 1 x 1 meter adalah sebanyak 10.000 stek rumpun.

a. Penanaman dengan stek.

- Stek diambil dengan tanaman yang sudah tua atau tanaman yang masih terlalu muda.
- Stek dipotong - potong sepanjang 25 - 30 cm atau paling sedikit terdiri dari dua mata tunas.

b. Penanaman dengan sobekan Rumpun.

Pada penanaman dengan menggunakan sobekan rumpun, maka dipilih rumpun muda yang tingginya 20 - 25 cm, tegak, besar, sehat dan tingginya sama dalam satu rumpun.



No. 03/YSP/ 1991 - 1992. Jalan Kolonel H. Basian No-6 Telp. 410155 (071) Kotak Pos 265 Palembang

Reproduced 65% of actual size. The original was printed on two sides in black, with the dark box at the top left in red. This *Liptan* is about cultivating King Grass; it is based on a publication by AARD's Central Research Institute for Animal Science.

Figure 3.2 *Liptan* technical fact sheet, produced by Palembang Agricultural Information Center, South Sumatra.

- *Buletin Informasi Pertanian* is an agricultural information magazine aimed at extension personnel. Each AIC publishes its own version for distribution within its own province (Figure 3.6). There are typically two to four issues a year, with the Lembang institute producing 40,000 copies of each in 1984; AIC Ciawi currently prints 6000 copies; the North Sumatra AIC, 3000.
- Other media, such as flip charts, models, and computer databases, are currently of minor importance. AIC Medan had by 1991 produced one flip chart with a print run of 200. AIC staff commented that the heavy paper and color printing required made flip charts expensive.

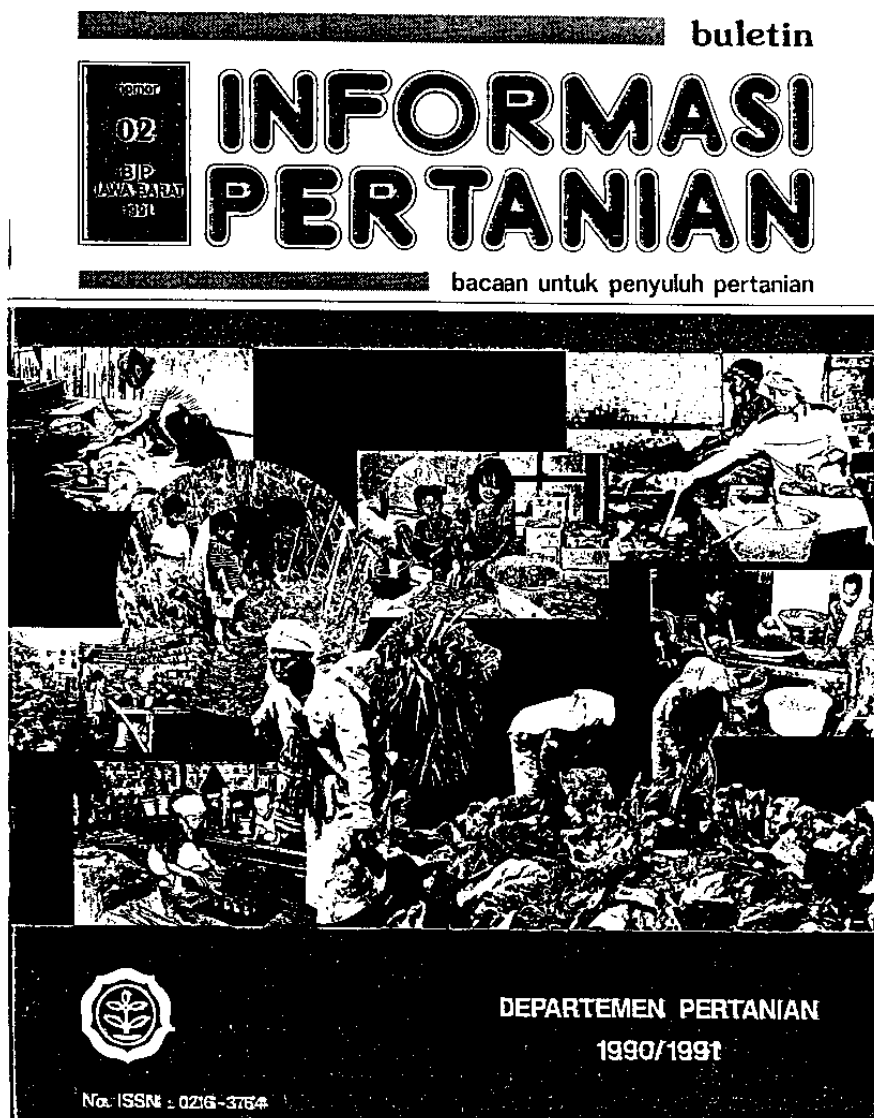
AIC Ciawi cooperates with CALREC (see below) in reproducing and distributing computer diskettes containing CALREC's CDS/ISIS literature database (CDS/ISIS is a textbase program promoted by Unesco). However, other AICs lack computer facilities and skills to use these diskettes.

Between 1984 and 1990, the 28 AICs produced a total of 4516 media titles in all formats except the *Buletin* (Table 3.3). Of these, 25% were on food crops, 22% on general topics such as extension methods and soil conservation, and 16-18% each were on livestock, fisheries, and estate crops.

Table 3.3 Numbers of media titles produced by the 28 Agricultural Information Centers, 1984-1990.

	Food crops	Live-stock	Fish-eries	Estate crops	General	Total
Booklets	159	135	126	131	178	729
<i>Liptans</i>	548	390	384	369	400	2091
Posters	70	57	41	50	83	301
Folders	92	49	55	47	42	285
Audiocassettes	197	143	122	84	228	774
Slide sets	88	48	47	51	47	281
Videos	10	8	1	7	29	55
Total	1164	830	776	739	1007	4516

Source: Tabulation from database of media titles compiled by BIP Ciawi (1990).



Front cover of a 1991 issue, reproduced 65% of actual size. The original has 28 pages of text with occasional black and white photographs and diagrams. The cover and centerfold are in high-quality full color. Other AICs produce similar magazines with the same name.

Figure 3.3 *Buletin Informasi Pertanian*, semiannual magazine produced by Lembang Agricultural Information Center, West Java.

The total of 4516 items may seem a large figure. But this number was produced over a period of six years by institutions in 27 provinces; material produced in one province was distributed only in that province. (The AICs do exchange materials with each other, but the number of copies is small.) Each AIC thus on average produced about $4516 \div 27 \div 6 = 28$ items per year.

Dividing again by four to take into account the four commodity subsectors (food crops, livestock, fisheries, and estate crops), we obtain a figure of seven items that an extension specialist can expect to receive each year on his or her specialty. The number of items reaching a field agent on each commodity will be smaller because not all items are produced in sufficient numbers to be distributed to all agents. Contact farmers will fare worse still, and follower farmers probably can expect to obtain media extremely rarely from the AICs.

Looking at the print runs of publications draws us to the same conclusion. The North Sumatra AIC produces about 3000 copies of each single-sheet *Liptan*. Yet there are 13,527 farmers' groups with 466,744 members in this one province (Biro Humas Deptan 1991:97-98). Three thousand copies of a publication are not even enough to provide each of the province's 1598 field extension workers with two copies -- one for themselves, and one to give away. Even the 30,000 copies of folders previously printed by the West Java AIC (Rusyana 1984) pale in comparison with the magnitude of the audience: 3337 field agents, and 37,177 farmer groups with 1,580,000 members (Biro Humas Deptan 1991:97-98).

Two major problems thus face the AICs' media production programs:

- The number of titles produced each year is inadequate.
- Inadequate funding means that print runs are too small to serve the intended audience of extension personnel and farmers. The audience thus by default becomes extension personnel alone.

Media development process Each year, the provincial *Dinas* offices determine the topics of forthcoming media materials to be produced by the local AIC. AIC SMSs then search for information on these topics. Respondents said they used *Dinas* information if this was available; they also sought information from the AIC library and nearby research institutes and universities. The SMSs prepare a draft in consultation with the *Dinas* personnel, and submit it for to the *Dinas* and their AIC colleagues for approval before going into production.

In a scheme similar to that used for researcher civil servants (see next chapter), extension personnel receive credit points that can be used for promotion purposes if they author extension publications or teach courses. However, the number of credit points awarded per publication or course is minimal, and the limited number of titles produced or courses offered restricts opportunities for extensionists to amass credits. This has two effects:

- It restricts opportunities for advancement among extension personnel, markedly lowering morale.
- Extension personnel and AICs have little motivation merely to reproduce research publications under an AIC imprint, since they would gain no credit points by doing so.

Despite this, AICs do occasionally republish research publications directly. The Medan AIC, for instance, has adapted and shortened an AARD technical manual on sheep and goat raising and published it in its booklet series.

Effectiveness of extension

The largest, and probably the most critical, data-based study of the extension system is Hussein's (1986) dissertation on the Indonesian agricultural knowledge system. After interviewing farmers, extension personnel and researchers in West Java, Hussein concluded that an integrated knowledge system did not exist because of the weaknesses of linkages among its component parts.

Other authors disagree on the effectiveness of the training and visit system in Indonesia. Some (e.g., Sukaryo 1983, Suryono 1985, Witjaksono 1990) see T&V as effective and a major improvement over the previous system, which was based at least in part on enforcing farmers' compliance with government programs. Others have criticized the system on various grounds. These include:

- Field extension workers are inadequately trained (Suhardjo 1989, Subarma 1985, Sutjipta 1982, Nur 1986).
- Farmers are little involved in planning meetings, and attendance at meetings with field agents is poor (Subarma 1985).
- Meetings are poorly timed and held at inconvenient locations (Subarma 1985, Nur 1986).
- Communication of extension information among farmers is poor (Hussein 1986, Surialaga 1984, Holian 1990).
- Field agents have too many farmer groups to serve (typically 16 in a two-week period) (Nur 1986, Hubeis 1987).
- T&V has had little impact on yields of 5 major non-rice crops (based on a cursory, macro-level, time-series analysis) (Hussein 1986:147-152).
- Farmer groups tend to include only wealthier farmers (Hussein 1986).
- Farmer groups often exist in theory rather than in practice (Hussein 1986, Hubeis 1987). Ministry officials will admit this in private.

Despite the problems associated with the current system, there is little discussion in

the literature or among the people I interviewed in favor of radical change. The tone is more toward improving those aspects of the system that need fixing, such as revising the organizational structure of the ministry and adjusting the responsibilities of field agents. Both these have in fact been recently put into effect:

- Responsibility for district extension staff and local Rural Extension Centers (*BPPs*) has been handed from the Ministry of Agriculture to local governments (which come under the jurisdiction of the Ministry of the Interior) (SK Bersama 1991).
- Oversight of provincial and district extension specialists has been moved from *Bimas* to the Secretariat-General, in preparation for a further move to the extension arms of the relevant Directorates-General.
- Instead of covering all topics, field agents will be responsible for extending information on a single commodity group, such as livestock or food crops.

While the impact of these changes had not yet been felt at the field level at the time of this study, many of the ministry and local staff interviewed felt some uncertainty as to their future status. Further change may be on its way as the ministry evaluates results of a major attempt to train farmers in integrated pest management (Röling, Gallagher and van de Fliert 1991, Stone 1992).

The mass media

Four main types of mass media concern this study: broadcast media, general newspapers, the agricultural press, and commercially published books.

Broadcast media

Most radio and television stations are controlled by government corporations, though privately owned television stations have recently begun to operate. Both radio and television carry programming related to agriculture; these include the radio program *Siaran Pedesaan* ("Rural Broadcast") and television programs such as *Dari Desa ke Desa* ("From Village to Village"). AICs and AARD research institutes are occasionally featured on these programs: for instance, one 1992 TV program featured researchers at AARD's Lembang Research Institute for Horticulture responding to viewers' questions about vegetable growing. The field extension agents I interviewed said that these programs were not broadcast at convenient times for them to view.

AICs prepare audiocassettes for radio broadcasts, and district *Dinas* offices have regular though infrequent opportunities (once every three months, according to an anonymous informant in a district office in North Sumatra) to collaborate in producing local radio broadcasts.

Hussein (1986:212, 241-243, 450-454) concludes that radio has great potential for disseminating information on agriculture, with more than 80% of farmers in West Java

listening to agricultural radio programs at least once a week. I was unable to find any direct evaluation of the use of AIC or AARD materials by the broadcast media or of the effectiveness of these materials when broadcast.

General newspapers

Indonesia's general newspapers can be divided into two groups: large metropolitan dailies such as *Kompas*, and *Surabaya Post*, and small, non-metropolitan newspapers. Both carry agriculture-related information. I know of no analysis of the content or effect of this type of coverage in the Indonesian press. In the metropolitan dailies with which I am familiar, most agricultural coverage falls into two broad categories:

- **Hard news**, such as the release of a new rice variety, the achievement of a record crop yield, or the inauguration of a new irrigation scheme.
- **Opinion**, as expressed through guest articles by policy makers, academics, and essayists.

The coverage of technical information in these newspapers is thus small.

The Ministry of Information subsidizes the production and rural distribution of several dozen non-metropolitan newspapers through its *Koran Masuk Desa* ("Newspapers Enter the Village") program. An example of a newspaper supported in this way is *Mitra Desa*, a farmers' paper published in Bandung, West Java.

Agricultural press

The agricultural press includes the biweekly newspaper *Sinar Tani* and several magazines.

Sinar Tani ("Farmer's Light," Figure 3.7) is an eight-page newspaper published twice a week by Duta Karya Swasta, a firm with links to the Ministry of Agriculture (my source on this is a member of the paper's editorial board). The editorial board includes ministry staff, one of whom is a senior AARD official responsible for coordinating the Agency's communication activities.

Presiden pada Pembukaan Pemas Pertasikencana:
Peningkatan Produksi Pangan Tetap Diperlukan

— Peningkatan Produksi akan Terus Terjadi —
KUD Harus Dipakai untuk Meningkatkan Produksi

Yogyakarta, 16 Juli — Presiden Republik Indonesia, Soeharto, dalam sambutannya pada upacara pembukaan Pemas Pertasikencana di Gedung Sate, Jakarta, Sabtu (16/7/91), mengatakan bahwa peningkatan produksi pangan akan terus berlanjut. Untuk itu, pemerintah akan terus meningkatkan peran KUD (Koperasi Unit Desa) sebagai wadah petani untuk meningkatkan produksi.



Dirjen Bina Perikanan, Ir. Abdulhadi Curi:
Dijera Perkebunan Percepat Pembentukan KUD di Lokasi PIR

Jakarta, 16 Juli — Dirjen Bina Perikanan, Ir. Abdulhadi Curi, mengatakan bahwa perkebunan akan mempercepat pembentukan KUD (Koperasi Unit Desa) di lokasi PIR (Pusat Industri Rakyat). Hal ini bertujuan untuk meningkatkan kesejahteraan petani di kawasan perkebunan.



Srihan HETI, Ir. H. Abdurrahman Rangkuti:
KUD Sudah Waktunya Mengarah ke Pengembangan Agribisnis

Peran KUD (Koperasi Unit Desa) sudah waktunya untuk bertransformasi dari sekadar wadah petani menjadi lembaga yang mengembangkan agribisnis. Hal ini diperlukan untuk meningkatkan daya saing petani di pasar internasional.

Dagang Angkut dan Industri Pertanian Kasakan RBM

Program bantuan bagi RBM (Rural Business Model) akan dilaksanakan di berbagai daerah. Hal ini bertujuan untuk meningkatkan produktivitas petani dan meningkatkan pendapatan mereka.

Varietas Unggul, Mengurangi Ketergantungan Penggunaan Pestisida

Penelitian menunjukkan bahwa penggunaan varietas unggul dapat mengurangi ketergantungan petani pada penggunaan pestisida. Hal ini dapat membantu mengurangi biaya produksi dan meningkatkan kesehatan lingkungan.

Terbata, Dana untuk Menyusun Peta, Penyediaan Komoditi Pertanian

Terbatasnya dana untuk penyusunan peta dan penyediaan komoditi pertanian menjadi kendala bagi petani. Hal ini dapat menghambat proses produksi dan distribusi barang.

**Wawancara Khusus dengan Sekretaris BP Bina, Ir. Amin Kabali:
 Faktor Manusia Menentukan Keberhasilan Koordinasi dan Keterpaduan Pembangunan**

Keberhasilan koordinasi dan keterpaduan pembangunan sangat ditentukan oleh faktor manusia. Hal ini menunjukkan pentingnya peran manusia dalam pembangunan nasional.

KUD Harus Tumbuh dan Berkembang Secara Alami

KUD (Koperasi Unit Desa) harus tumbuh dan berkembang secara alami, tanpa intervensi berlebihan dari pemerintah. Hal ini akan memastikan keberlanjutan KUD di masa depan.

Pesan dan Harapan Beberapa Pejabat pada Pemas Pertasikencana

Beberapa pejabat memberikan pesan dan harapan pada upacara Pemas Pertasikencana. Mereka berharap pemerintah akan terus mendukung petani dalam meningkatkan produksi.

Pelayanan Dokter Hewan Hendaknya ke Desa-desa

Pelayanan dokter hewan hendaknya diarahkan ke desa-desa untuk meningkatkan kesehatan ternak petani. Hal ini akan membantu meningkatkan produktivitas peternakan.

Ayam Peking "Si Lency" Juara Nasional

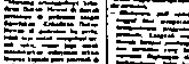
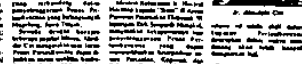
Ayam Peking "Si Lency" memenangkan juara nasional dalam kompetisi ayam. Hal ini menunjukkan kualitas unggul dari varietas tersebut.

Kita Mantapkan Petani-Nelayan Tangguh, KUD Mandiri dan KB Mandiri dalam Mewujudkan Pembangunan Nasional

Pemerintah akan mantapkan petani dan nelayan yang tangguh, KUD yang mandiri, dan KB yang mandiri sebagai pilar pembangunan nasional.

Saung TANI

Saung TANI adalah wadah untuk berbagi informasi dan pengalaman petani. Hal ini akan membantu petani dalam memecahkan masalah mereka.



Artikel ini membahas tentang pentingnya peran petani dan nelayan dalam pembangunan nasional. Hal ini juga membahas tentang peran KUD (Koperasi Unit Desa) dan KB (Koperasi Buruh) dalam meningkatkan kesejahteraan petani dan nelayan.

Front cover of a 1991 issue, reproduced 65% of actual size. The original has 28 pages of text with occasional black and white photographs and diagrams. The cover and centerfold are in high-quality full color. Other AICs produce similar magazines with the same name.

Figure 3.4 Buletin Informasi Pertanian, semiannual magazine produced by Lembang Agricultural Information Center, West Java.

Sinar Tani has a circulation of 48,000. Of these, 23,000 copies are sent to extension personnel and farmers, 19,000 to estate crops parastatals, and the remaining 6,000 to other subscribers. Only a small number of senior officials receive complimentary copies; all others are paid subscriptions for Rp 3,000 (\$US 1.50) per month. According to district extension personnel, subscriptions are typically drawn from funds allocated for extension activities at each institution.

Trubus (Figure 3.8) is Indonesia's leading horticultural magazine. Published monthly, it focuses on ornamental plants, fruits, and pets (including ornamental fish) and occasionally covers field and plantation crops and livestock. It retails for Rp 3,000 per copy and is available at newsstands.

According to a consultant to the magazine, *Trubus* readers comprise two main groups: business people and hobbyists. Many readers in university towns are students. The circulation is 51,000.

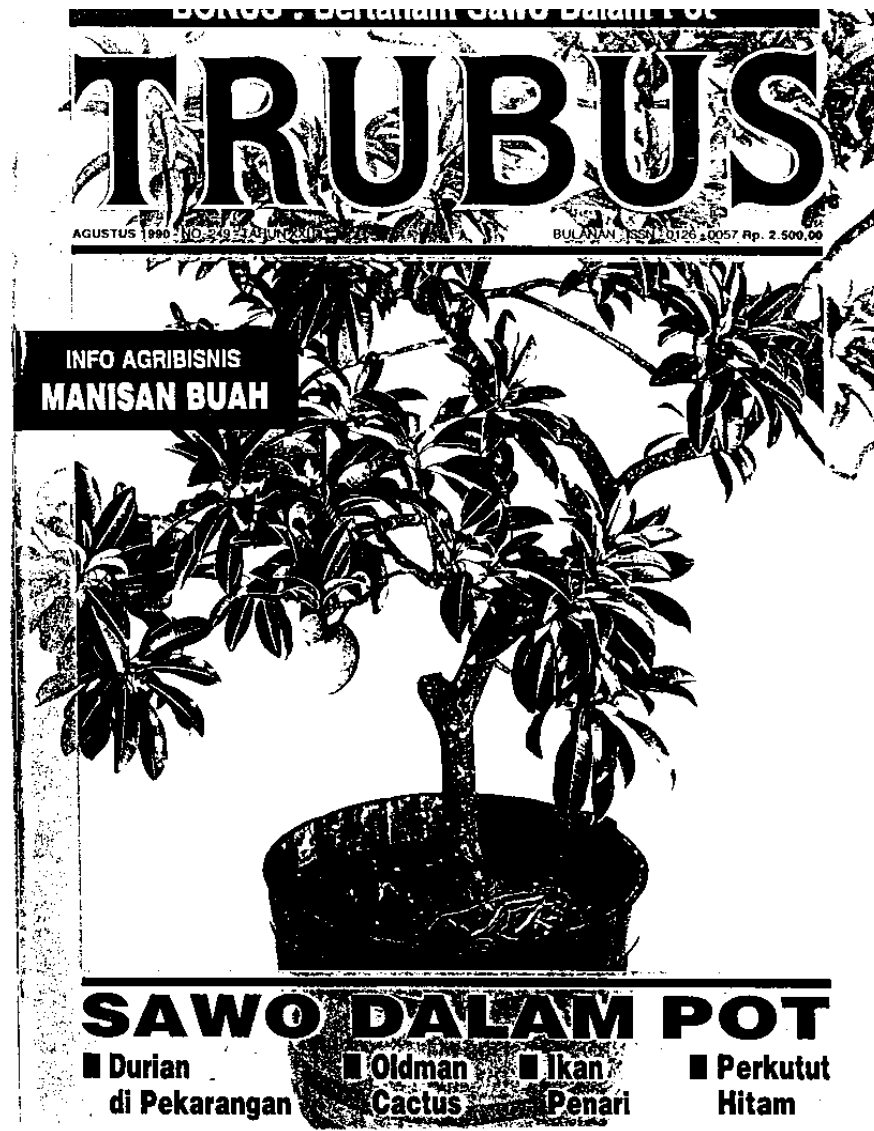
This informant said that sources for articles in *Trubus* include academics, experienced horticulturists, AARD researchers, and other specialist media, including foreign horticultural magazines.

Other magazines include *Setia Kawan* (a magazine aimed at farmers and published by the same group as *Trubus*), *Poultry Indonesia*, *Tumpang Sari*, *Tani Mukti*, *Majalah Pertanian* (Hussein 1986:215), and the AIC magazine *Buletin Informasi Pertanian* (Figure 3.6). Hussein found these to be of minor importance individually as information sources for farmers, though 10% of his farmer respondents read at least one of them. Hussein does not report readership of such magazines by extension personnel.

Commercially published books

Several firms publish agricultural books in the Indonesian language. The majority are technical guides on such topics as growing maize and keeping rabbits. The number of university-level textbooks in Indonesian is increasing, though few are yet available. Several textbooks aimed at the agricultural secondary school market are also available.

A measure of the availability of agricultural books can be gained by inspecting the stock lists of bookstores. I obtained lists from the three largest private bookstores stocking agricultural titles in Bogor, West Java -- home of the country's largest agricultural university and center of the government's agricultural research activity. I also obtained lists from the ESCAP CGPRT Centre, a United Nations institute in Bogor that distributes titles from several international agricultural research centers. A summary of these lists is presented in Table 3.4.



Front cover of a 1991 issue, reproduced 65% of actual size. The original has 28 pages of text with occasional black and white photographs and diagrams. The cover and centerfold are in high-quality full color. Other AICs produce similar magazines with the same name.

Figure 3.5 *Buletin Informasi Pertanian*, semiannual magazine produced by Lembang Agricultural Information Center, West Java.

Table 3.4 Numbers and prices of agricultural books stocked by bookstores in Bogor, West Java, 1991.^a

Bookstore	Indonesian			English		
	Titles	Price (Rp)		Titles	Price (Rp)	
		Mean	Std Dev		Mean	Std Dev
Wisma Batik ^b	618	5420	8149	405	98,346	87,966
Gunung Agung ^c	301	4071	4225	0	-	-
P T Fila ^d	No list available			296	28,218	49,656
CGPRT Centre ^e	0	-	-	177	14,405	13,198

^a Sources: Stock lists provided by bookstores.

^b Caters mainly to university.

^c Agriculture section of general bookstore.

^d Mainly old stock.

^e United Nations institute. Stocks international research center titles only.

This table shows that a large number of reasonably cheap Indonesian-language books are available -- at least in metropolitan areas like Bogor. But the prices must be compared with the salary levels of Indonesian agricultural professionals: a recent graduate beginning work as an SMS or junior researcher earns about Rp 120,000 (\$US 60) per month. This is not enough to maintain commonly accepted living standards for people with similar education levels. An SMS is thus likely to purchase even the moderately priced Indonesian books only rarely. Most English-language books are far too expensive for all but the wealthiest.

Summary

The Indonesian agricultural extension system is large and complex. It needs to cover a wide range of commodities in an extremely diverse and dynamic physical and social environment. Indonesia's farmers, whom this system must serve, are very numerous, diverse, and scattered across thousands of islands. Rapid population growth and the growing urban-industrial sector further add to the urgency of providing improved technology and information to this audience. The country's lack of strong private and university sectors that can do this puts a huge burden on the Ministry of Agriculture to provide these services.

Research and extension are separated administratively within the ministry, as are the major commodity groupings from each other. This allows efficient administration of the various functions related to research and extension of each commodity. But it also presents challenges to smooth communication between research and extension. This is the subject of the next chapter.